IN THE CLAIMS

1.-18. (Canceled)

19. (Currently Amended) A diffusion barrier comprising a plurality of stacked sub-layers, each sub-layer having a thickness of about 0.4 to about 4.5 nm, which is predetermined to inhibit the formation of a crystalline lattice, to inhibit diffusion of a chemical species through the diffusion barrier.

20. (Original) A diffusion barrier as in claim 19, wherein the sub-layers are comprised of alternating layers of at least two different materials.

21. (Original) A diffusion barrier as in claim 20, where one of the materials is scandium (Sc).

22. (Original) A diffusion barrier as in claim 20, where one of the materials is copper (Cu).

23. (Original) A diffusion barrier as in claim 20, where one of the materials is yttrium (Y).

24. (Currently Amended) A diffusion barrier as in claim 20, where one of the materials is

lanthanum (La).

25. (Original) A diffusion barrier as in claim 20, where one of the materials is tantalum (Ta).

26. (Original) A diffusion barrier as in claim 20, where one of the materials is a metal nitride.

27. (Original) A diffusion barrier as in claim 20, where one of the materials is an oxide.

28. (Original) A diffusion barrier as in claim 20, wherein the at least two materials selected to comprise the sub-layers are substantially immiscible.

29. (Original) A diffusion barrier as in claim 20, wherein the at least two materials selected to comprise the sub-layers exhibit mutual adhesion.

30. (Withdrawn) An integrated circuit comprising a substrate, having an electrically conductive feature disposed on said substrate, further comprising a diffusion barrier interposed between said substrate and said electrically conductive feature, said diffusion barrier comprising a plurality of stacked sub-layers, each sub-layer having a thickness predetermined to inhibit the formation of a crystalline lattice.

31. (Withdrawn) An integrated circuit as in claim 30, where at least one of said sub-layers is comprised of a metal.

32. (Withdrawn) A circuit structure comprising a substrate and an electrical interconnect comprised of copper (Cu), further comprising a diffusion barrier interposed between said substrate and said electrical interconnect, said diffusion barrier comprising a plurality of stacked sub-layers.

33. (Withdrawn) A circuit structure as in claim 32, where said sub-layers are comprised of copper (Cu) and tantalum (Ta).

34. (Withdrawn) A circuit structure as in claim 32, where said sub-layers are comprised of scandium (Sc) and tantalum (Ta).

35. (Withdrawn) A circuit structure as in claim 32, where said sub-layers are comprised of yttrium (Y) and tantalum (Ta).

36. (Withdrawn) A circuit structure as in claim 32, where said sub-layers are comprised of lanthanum (La) and tantalum (Ta).

37. (Withdrawn) A circuit structure as in claim 32, where at least one of the sub-layers is comprised of a metal nitride.

38. (Currently Amended) A multilayer diffusion barrier comprised of interfaces and atomically thin films in which ~~the~~ surface adhesion of each interface inhibits the formation of a lattice in ~~the bulk of~~ the individual film layers, inhibiting diffusion across the barrier, wherein thickness of each film is in a range of about 0.4 to about 4.5 nm.

39. (Currently Amended) A multilayer diffusion barrier as in claim 38, where the ~~films~~ thickness of each film is in a range of about two atoms to about five atoms.

40. (Currently Amended) A multilayer diffusion barrier as in claim 38, where the ~~films~~ thickness of each film is in a range of about 0.4 nanometers to about 1.5 nanometers.

41. (Currently Amended) A multilayer structure comprised of three or more sub-layers each having a thickness of about 0.4 to about 4.5 nm and an interface, wherein the interface of each of the sub-layers dominates a ~~the~~ lattice formation on the sub-layers, preventing the formation of a lattice and grain boundaries, to inhibit diffusion of a chemical species through the structure ~~barrier~~.

42. (Original) A multilayer structure as in claim 41, where each of the sub-layers is

comprised of a metal.

43. (Currently Amended) A multilayer diffusion barrier for inhibiting diffusion of chemical species there through, comprising a plurality of stacked layers comprised of alternating films of at least two different metals, the thickness of each of said films being between about 0.4 to about 4.5 nm, which is predetermined to substantially eliminate work hardening.

44. (New) A multilayer structure comprised of at least two films forming a bond at an interface between each film, each film having a thickness of about 0.4 to about 4.5 nm, wherein the interface dominates a lattice formation, inhibiting the formation of a lattice and grain boundaries.

45. (New) The multilayer structure of claim 44, comprising alternating layers of at least two different materials.

46. (New) The multilayer structure of claim 44, wherein each film has a thickness of about 0.4 to about 3.0 nm.

47. (New) The multilayer structure of claim 45, wherein the at least two materials exhibit mutual adhesion and are substantially immiscible.

48. (New) The multilayer structure of claim 45, wherein at least one of the materials is a metal.

49 (New) The multilayer structure of claim 45, wherein at least one of the materials is a nitride.

50. (New) The multilayer structure of claim 45, wherein at least one of the materials is a dielectric material.

51. (New) The multilayer structure of claim 45 comprising three or more layers.

52. (New) The multilayer structure of claim 44, having flexibility and inhibited work hardening.

53. (New) The multilayer structure of claim 44, which is a diffusion barrier between two materials that are otherwise capable of combining chemically or between a layer and a surface capable of chemically combining with the layer.